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### 3. BREEDING HABITS OF THE FIELD RAT *MILLARDIA MELTADA* (GRAY)

## INTRODUCTION

Of the 91 species of rats and mice found in India, at least 25 occur in the Punjab (Deoras 1964). Among the field rats found around Ludhiana, *Millardia meltada* (Gray) is very common and comprised 50 per cent of the rats collected during September-November. It is abundant, and along with other species of rats, causes serious damage to important field crops like wheat, gram, sugarcane, groundnut etc. Previously, efforts to breed *Tatera indica*, another important species, in captivity for studies on its biology did not meet with success due to its cannibalistic habits (Singh 1961). Cannibalism was a problem in *M. meltada* also, but during the period of this study it was possible to reduce cannibalism to a low level in this species by giving special food; and the results of the study on its breeding habits in captivity are presented in this paper.

## MATERIAL AND METHODS

Twenty new born young with their mothers were dug out from fields during March to May, 1965. These were kept in breeding cages measuring 45×30×22.5 cm. made of strong wire netting. The bottom of each cage was provided with a sliding metal tray for collecting faeces and urine. To provide darkness and privacy the cages were painted black.

TABLE I  
BREEDING PATTERN OF SIX PAIRS OF FIELD RAT, *Millardia melitada* (GRAY) IN CAPTIVITY

	Pair Number					
	1	2	3	4	5	6
<sup>1</sup> Approximate date of birth of parents	18.3.65 (♀) 5.5.65 (♂)	20.4.65	25.4.65	25.4.65	5.5.65	5.5.65
Date of pairing	2.6.65	2.6.65	2.6.65	2.6.65	2.6.65	2.6.65
Ist Litter :	23.8.65 5	25.8.65 3	14.8.65 3	26.3.66 4	21.8.65 2	29.8.65 2
IIrd Litter :	16.9.65 3	26.3.66 6	18.9.65 4	16.4.66 2	26.3.66 2	9.4.66 3
IIIrd Litter :	26.3.66 5	15.4.66 4	17.3.66 2	Female died on 11.6.66	6.5.66 1	20.5.66 3
IVth Litter :	7.8.66 4	6.5.66 4	17.9.66 2	—	27.9.66 1	28.7.66 4
Vth Litter :	29.8.66 8	Male died on 13.6.66	—	—	—	18.8.66 4
VIth Litter :	26.9.66 3	—	—	—	—	10.9.66 4
VIIIth Litter :	—	—	—	—	—	1.10.66 5

<sup>1</sup> The parents were field collected young and their dates of birth were estimated on the basis of the condition at the time of capture.

placed on racks and curtained. They were fed on gram flour enriched with multivitamins, ostocalcium and sugar at the rate of 2, 2 and 10 per cent, respectively. The quantity of food and water provided was always in excess of their requirements and food was renewed every day. The mother rats were removed as soon as their young started feeding on flour bait. Only 15 (7 males and 8 females) of the 20 young survived up to 2 June, 1965, when pairing was done. Thus, 7 pairs were made and the extra female was discarded. In 6 out of the 7 pairs, siblings were paired. Each pair was placed in a cage of the dimensions mentioned above. The young produced by each pair were allowed to remain in the same cage until they started feeding on the flour bait, when they were separated and placed in a different cage.

### RESULTS AND DISCUSSION

Out of the seven pairs, one pair died on 23 July, 1965, without producing a single litter. The breeding records of the remaining 6 pairs are presented in Table 1. The young born in captivity to rats of first generation in the month of August were paired in the month of October, and their breeding behaviour is given in Table 2.

TABLE 2

BREEDING IN SECOND GENERATION *Millardia meltdada* IN CAPTIVITY

Sr. No.	Date of birth	Date of pairing	Date of litter production	Number of young in the litter
1.	23.8.65	23.10.65	15.4.66	4
2.	21.8.65	23.10.65	18.4.66	6

**Breeding Seasons :** As seen in Table 1, litters were produced in two breeding periods : (i) from March to May and (ii) from August to October. These findings are in agreement with those of Deoras (1964) who maintains that in Bombay rats breed mainly during the hot months, one peak being during August to October and the other during March to May. This is also supported by the findings of Singh (1961) who found that in the field, the young of *Tatera indica* are available with their mothers in the months of March to May and again in October to November.

**Number of litters and young per litter :** In each breeding period *M. meltdada* reproduced 1 to 4 times—a female produced a maximum of 3 litters during March to May and 4 litters during July to September,

Thus, the number of litters in an year may range from 2 to 7. This observation is similar to that of Burton (1962) who reported that in a year *Rattus rattus* and *Rattus norvegicus* produced 5 to 6 litters and 6 litters, respectively.

TABLE 3  
APPROXIMATE GESTATION PERIOD IN THE FIELD RAT, *Millardia meltdada*

Sr. No.	Date last litter	Date next litter	Approximate gestation period (Days)
1.	23.8.65	16.9.65	24
2.	14.8.65	18.9.65	35
3.	26.3.66	15.4.66	20
4.	26.3.66	16.4.66	21
5.	26.3.66	6.5.66	41
6.	9.4.66	20.5.66	41
7.	15.4.66	6.5.66	21
8.	28.7.66	18.8.66	21
9.	7.8.66	29.8.66	22
10.	29.8.66	26.9.66	28
11.	18.8.66	10.9.66	23
12.	10.9.66	1.10.66	21

During this laboratory study the 6 pairs produced 93 young in 27 litters and the number of young ones per litter varied from 1 to 8, the average being 3.44; whereas in field collections each of 6 litters contained 5 to 8 young, the average being 6. These numbers are quite comparable with 7 to 8 young per litter in case of *R. norvegicus* (Perry 1945) and 6 young per litter in case of *R. rattus* (Watson 1951). In all cases, the females gave birth to the young at night. This finding is in line with that of Snell (1941).

*Gestation period:* Mating was not observed because it might be occurring at night or for extremely short intervals if it occurred during the day. Also no chemical pregnancy tests were carried out to determine the gestation period. However, the data presented in Table 3 indicate that the minimum period elapsing between the dates of production of two consecutive litters was 20 days. This means that the gestation period was 20 days or even shorter than this. This is comparable with the figure (21 days) given by Clegg & Clegg (1963) for rats in general and 20 to 26 days in *R. norvegicus* and 21 to 30 days in *R. rattus* reported by Burton (1962).

*Maturity:* Out of the 20 field collected young the 6 females that were used for the study of breeding habits, produced their first litter after 158, 127, 111, 335, 108 and 116 days respectively and considering that the

gestation period is about 20 days, the probable time taken to attain sexual maturity in these six cases works out to 138, 107, 91, 315, 88 and 96 days, respectively. Thus, in case of young born in the months of March to May the time taken to attain maturity varied from 3 to 4½ months with the result that irrespective of the month of their birth all the 6 females born in the March to May breeding season produced their first litter during August the same year. However, there was one exception wherein the female produced its first litter only after 334 days or 11 months (Table 1). The two females born in the laboratory during August and paired in October produced their first litter in the following April i.e. after a period of 215 and 220 days or approximately 7 months (Table 2).

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## 4. NEW RECORDS OF MAMMALS FROM RAJASTHAN, INDIA

Since the publication of the recent authoritative literature on the distribution of Indian Mammals by Pocock (1939, 1941), and Ellerman & Morrison-Scott (1951), several new records of mammals have been made by Prakash (1956, 1957, 1959, 1961, 1963a, 1963b, 1964) and Agrawal (1967) from Rajasthan. The recent mammalian collections made in Rajasthan by various parties of the Rajasthan Desert Survey of the Zoological Survey of India include examples of two species of mammals,